REMARKS

In the first office action, the examiner rejected claims 1-2, 4-10 and 13-14 under 35 U.S.C. 103(a) as being unpatentable over Katsuzawa et al (US 5084642) in view of Rentschler et al (US 6599351). The remaining claims were rejected as being unpatentable over the same two references and further in view of Collong et al (US 6008314) as to claim 3 and further in view of Lentz et al (US 6663362) as to claims 11 and 12.

For the reasons described below, applicant respectfully disagrees with the examiner's analysis and therefore requests reconsideration of claims 1-14 and consideration of new claim 15. Claim 1 has been amended to insert "the housing jacket (1) being an integral casting". This is disclosed at paragraph [0024], Page 7, lines 9-10.

Before describing the reasons applicant believes that the claims are allowable, applicant would like to disclose to the examiner that the parallel European patent application, filed with the same claims as initially presented in this U.S. application, led to the grant of a European patent (EP 1 554 793) without further amendment of the claims and with the European examiner having knowledge of Katsuzawa et al (US 5084642). Applicant fully recognizes that the U.S. examiner is not compelled to come to the same conclusion, but the allowance in the European Patent Office is believed to support the reasonableness of applicant's position and applicant's belief that the claims of this application are allowable.

The claims are allowable for reasons that may be briefly summarized as follows. The invention is a coolable electric motor housing jacket (an electric motor housing that includes a cooling jacket) that has (1) the coolant flow passages in a single, unitary housing jacket 1; (2) a protective coating on the internal walls and channels that define those coolant flow

passages, the protective coating being applied by cathodic dip-varnishing; and (3) in the dependent claims has the detailed structural features that allow the jacket to be an integral casting and that also maximize the advantages and effectiveness of the coating on the inner passages of the integral jacket. In other words, one important feature of the invention is that the interior walls forming the coolant passages are coated with a protective coating. The prior art does not show that. Another important feature is the integral one piece structure of the jacket 1 which has the flow passages in the one unitary casting [the English word "integral" was translated from the German word "einstückiges" which literally means "one piece"]. Applicant's sealing pressure ring 17, fastened at one end of the jacket 1, has no passages through it. The sealing pressure ring 17 just seals off the openings at the end 5a of applicant's jacket 1. The prior art Katsuzawa et al reference has the coolant passages distributed over *three* component parts of its casing. Applicant's integral casting, in which the inner passages are formed, facilitates application of the internal protective coating, reduces the opportunities of coolant leakage and reduces the manufacturing and assembly costs.

Katsuzawa is correct when he says in the Abstract, "It is, however, difficult to cast a casing with a complex channel, and the manufacturing costs are high." But the difficulty is greatly increased when trying to cast a casing in which the inner passages can be coated via a dip-varnishing process and can be formed in an integral casting. Applicant has accomplished both.

Applicant now turns to these points in detail.

Applicant teaches, and applicant's claims include, a protective coating on the inner faces and internal walls and channels of the coolant flow passages applied by cathodic dip-varnishing.

Applicant agrees that the Katsuzawa reference shows what the examiner attributes to Katsuzawa in the paragraph overlapping the bottom of page 2 and top of page 3 of the last office action. The examiner also recognized that Katsuzawa does not teach a protective coating of the jacket inner faces via a cathodic dip-varnishing process. However, the examiner said that "Rentschler teaches (col. 3, lines 23-25) a coating of the metal casting inner faces via a cathodic dip-varnishing process."

Applicant respectfully urges that this rejection should be withdrawn because Rentschler does not teach a coating on any metal casting inner faces. It is true that Rentschler does teach use of his pigments in a cathodic dip-varnishing process. Applicant recognized that the cathodic dip-varnishing process was known in the last sentence of paragraph [0006] of applicant's patent application. Rentschler confirms that fact. But Rentschler says only that his pigments are used in the automobile industry, watercraft construction and the protection of buildings (col.3, lines 29-30). At column 1, lines 21-22 Rentschler also mentions "weather resistance". These uses of his pigments imply use on external surfaces, the surfaces that are exposed to weather. There is no teaching in Rentschler, that applicant could find, of coating jacket inner faces or channel internal walls. Although Rentschler is in the same field of endeavor as dip-varnishing, Rentschler is not in the same field of endeavor as electric motor housings or casings.

In addition, as the examiner recognized, Katsuzawa does not teach a protective coating of the jacket inner faces via a cathodic dip-varnishing process. There are two aspects of that statement, the first one of which is important. Katsuzawa does not teach a protective coating of jacket inner faces with anything. The secondary aspect of the statement is that Katsuzawa does not teach a cathodic dip-varnishing process.

Since neither reference gives the slightest hint of applying any kind of protective coating to the inner surfaces of an electric motor housing, casing or jacket, there is no basis for combining them that is founded upon the prior art. Even if they were combined, they do not teach coating the jacket inner faces. Consequently, because no reference teaches coating the inner surfaces of coolant passages in a housing jacket for an electric motor, the claims are believed allowable. It was not obvious to a person of ordinary skill in the electric motor field, or in the electric motor housing field, that the inner walls of the coolant passages of an electric motor housing jacket could be coated with a protective coating or that it could be coated via a cathodic dip-varnishing process.

The second distinction from the prior art is in the structure of applicant's housing jacket. Applicant's housing jacket is an integral casting which has the coolant passages in the integral jacket. This results in an assembled, complete casing having fewer parts than the Katsuzawa casing. The existence of fewer parts provides advantages in both manufacturing and use. New claim 15 is added and is directed more explicitly to the combination of this feature and the inner coating feature. Claims 6 and 7 also recite more detailed structural features that make this integral configuration happen effectively.

An examination of the Katsuzawa reference shows that its assembled, complete casing has three cast metal parts: a central casing 10; a front end casing 12; and a rear end casing 14. A person would expect, and there appear to be in the Katsuzawa drawings, two sealing bodies (gaskets) at the two interfaces, one at each end of the Katsuzawa central casing 10. As shown in Figs. 1, 2, and 4 of Katsuzawa, the coolant passages or channels extend through all three of

those parts. In other words, the passages or channels of the Katsuzawa structure are distributed among three parts.

However, applicant's assembled, complete casing has two parts. Those parts are the housing jacket 1 and the pressure ring 17 that seals the openings at the end 5a of the housing jacket 1. This structure is described most extensively in paragraph [0030] on page 11 and illustrated in Fig 12. Importantly, it is applicant's housing jacket 1 that contains the coolant passages or channels. The sealing pressure ring 17, fastened at one end 5a of applicant's housing jacket 1, does not have any passages through it. The passages in applicant's integral housing jacket are the parallel cooling channels 2, the transverse ducts 14 formed within the housing jacket 1 at the end 5b and the passage for the 180° flow deflection 13 illustrated in Figs. 2, 3 and 12. The sealing pressure ring 17, with its sealing body (gasket) 22 just seals off the openings at the end 5a of applicant's jacket 1.

Applicant's different structural design has several advantages. Applicant has only one component, the housing jacket 1, that has inner walls of coolant passages that need to be treated in order to apply the protective coating on those inner walls. If someone wanted to coat the inner walls of the Katsuzawa structure, there would be three pieces to treat because all three have passages. With applicant's structure, a non-corrosive material can be chosen as the sealing body (gasket) 22 and therefore applicant's sealing body 17 does not require coating.

Katsuzawa's structure has four interfacing end surfaces that seat against a gasket and therefore need to be machined flat to seal to the gasket. Applicant's structure has half as many interfacing end surfaces and therefore half as many such machining operations.

Additionally, as a practical matter, every sealing surface presents a risk of leakage and the risk of leakage increases where there are holes through the gasket material. Any leakage around a hole and between the gasket and an end surface can cause corrosion of the end surface and present a risk of leakage. All four of Katsuzawa's interfacing end surfaces are exposed to that leakage risk because there are holes through Katsuzawa's two gaskets leading to the passages in Katsuzawa's two end casings. The holes expose the surfaces on both sides of each gasket to the coolant. Therefore, all four of Katsuzawa's gasket-contacting end surfaces are exposed to the leakage risk. Applicant's structure has one gasket 22 and that gasket has no holes Therefore, in applicant's configuration, there is only one end surface with such a leakage risk. Consequently, Katsuzawa's structure has four times as many end surfaces with the risk of leakage.

An additional advantage of applicant's structure is that there are only two pieces that need to be assembled together but with Katsuzawa's structure there are three pieces that need to be assembled. Applicant's structure provides reduced labor and time for assembly because every single one of these individual production steps means an increase in costs and an increase in the time needed for manufacturing and assembly.

In Katsuzawa's structure, longitudinal holes 16a and 16b and lateral holes 18a and 18b are formed on the front and rear end casings 12 and 14 by drilling (cf. col. 2, line 58, to col. 3 line 18). These are the holes that communicate with the going channels 15a and return channels 15b. The drilling of such deep holes, especially in the rear casing 14, is complex and costly. Furthermore, each of these drilled holes must be sealed against leakage by sealing plugs. There appears to applicant's attorney to be at least 8 such holes 16a and 16b in *each* of Katsuzawa's

end casings 12 and 14 for a total of 16 such holes. Although applicant also drills some holes, applicant has far fewer. Applicant's undersigned attorney counts three such holes 14 in applicant's structure.

Finally, it should also be appreciated that, despite the integral, one piece nature of applicant's housing jacket 1, there are still plenty of passages and openings in the housing jacket 1 to permit the dip-varnishing liquid, and any cleaning liquid, that is filled within the housing jacket 1 during the protective coating process and a subsequent cleaning process, to fully circulate and to be flushed fully from the housing jacket 1.

Applicant respectfully submits that none of the above-described advantages of applicant's structure, and certainly not the extensive collection of so many advantages, are foreseeable or obvious from the prior art. Applicant's invention has fewer pieces, avoids many manufacturing and assembly steps and avoids the leakage risks described above. These advantages arise from the integral, one piece nature of applicant's housing jacket 1 and from the structural details described in the dependent claims. The redirection of the longitudinal, coaxial cooling channels 2 at the ends of applicant's housing jacket 1 is accomplished within applicant's one piece, integral cooling jacket.

Neither Katsuzawa nor Rentschler give any hint of an integral, one piece housing jacket and neither gives a hint of coating the interior walls of the coolant passages. No reference teaches anything that would lead an ordinary worker in the field to even think that any of the advantages of applicant's invention are possible and nothing in the prior art would motivate an ordinary worker to try to find a structure that would accomplish these advantages.

Because Katsuzawa does not teach any kind of protective coating for their motor casing and Rentschler merely teaches a composition and a method for applying a corrosion-inhibiting coating by dip-varnishing in the automotive, watercraft or building industries, there is no basis for a skilled worker to apply dip-varnishing to a motor casing, and especially not to the inner passages of a motor casing. The automotive, watercraft or building industries are a different field of endeavor than the electrical motor industry.

Applicant alone has conceived that it would be advantageous to use the dip-varnishing process for an electric motor casing in which a coolant circulates. Applicant alone has conceived that the inner passages of the casing can be protectively coated. And applicant alone has found a way to construct such a casing not only so that these things can be done, but also so that they can be done in a way that reduces time and cost of manufacture.

Therefore, applicant respectfully requests reconsideration and allowance.

The Commissioner is authorized to charge Deposit Account No. 13-3393 for any insufficient fees under 37 CFR §§ 1.16 or 1.17, or credit any overpayment of fees.

Respectfully submitted,

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Date of Signature

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